

Figure 4.3.1 Formant plot of oral vowels of Ho speakers. er=ɛ, eh=ə and orr=ɔ.

Figure 4.3.2 shows the nasalized vowels produced by speakers of the Ho dialect. They are all scattered in the acoustics space. [ɪ̃] is located around the same F2¹ region as the orals but lower with a higher F1 values rising between 300 and 400 Hz. The mid front and back-nasalized vowels of this dialect are all clustered around the same frequency area as the oral ones except that [ũ] is more shifted from the peripheral toward the center as compared to [u]. The result of the ANOVA test of significance did not show any effect on vowels here either. For instance, the least effect is $F(9) = .246$, $p < .759$ and it is for the vowel [õ].

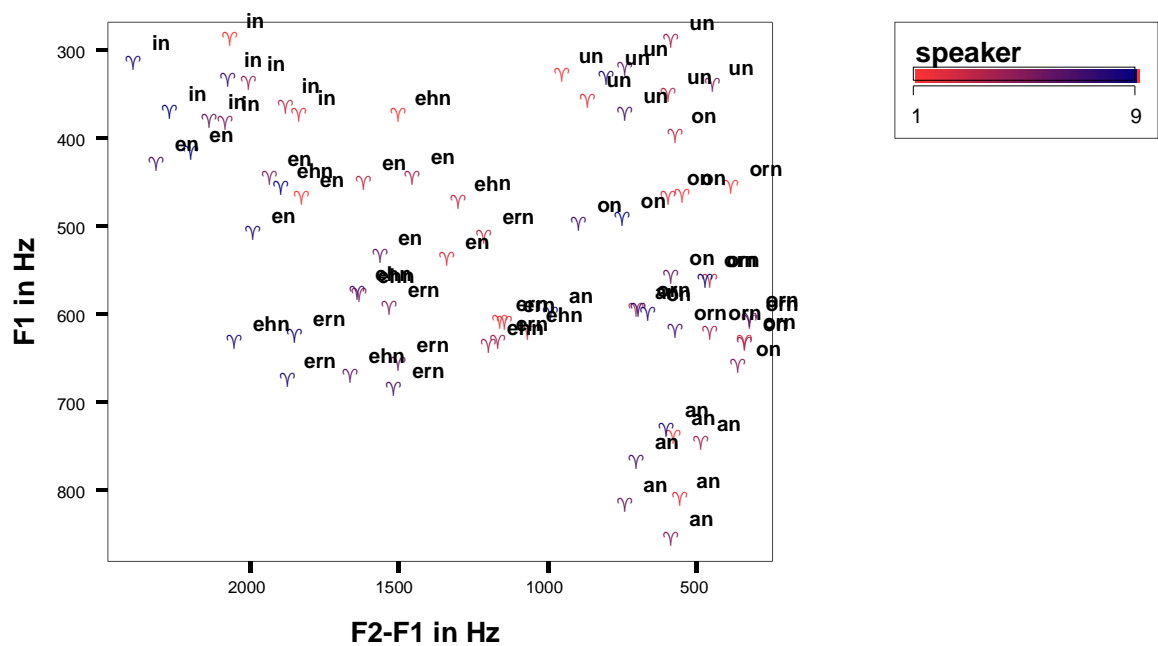


Figure 4.3.2 Formant plot of nasalized vowels of Ho speakers. in=ĩ , en=ẽ, ern=ẽ, an= ã, un=ũ, on=õ and orn= ẽ.

The paired sample test to test the difference between the overlapping and clustered vowels for all speakers produced the result as presented in table 4.31 below. The results indicate that speakers of this dialect do not clearly distinguish between these vowels. The nasalized ones especially have a significant effect of interaction meaning these vowels not significantly different from each other. There are significant differences (0.567 and 0.335) for the pairs [u]-[o] and [ũ]-[õ] is greater than $p < 0.05$. This means that like the other two dialects discussed above, Ho speakers also do not differentiate between the productions of these vowels.

Table 4.3.1 Paired sample T-test for main effect and interaction of the vowels [e], [ɛ], [ə], [u], [o] and their nasalized counterparts of Ho speakers.

Vowel Pairs	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Dev.	Std. Error Mean	95% confidence Interval of Difference				
				Lower	Upper			
e-ε	-6.30	109.54	21.08	-49.63	37.04	-299	26	.768
e-ə	79.90	107.56	23.47	30.94	128.86	3.404	20	.003
ε-ə	78.86	145.59	31.11	13.95	143.76	2.534	20	.020
ẽ-ẽ	289.22	781.51	150.40	-19.93	598.38	1.923	26	.065
ẽ-ə̃	258.22	777.15	149.56	-49.21	565.65	1.727	26	.096
ẽ-ə̃	-31.00	118.52	22.81	-77.89	15.89	-1.359	26	.186
u-o	13.04	116.84	22.49	-33.18	59.26	.580	26	.567
ũ –õ	1162.22	6152.82	1184.11	-3596.20	1271.75	-982	26	.335

4.4 Kpando speakers

Figure 4.4.1 shows the formant plot of the mean values of the vowels produced by each speaker.

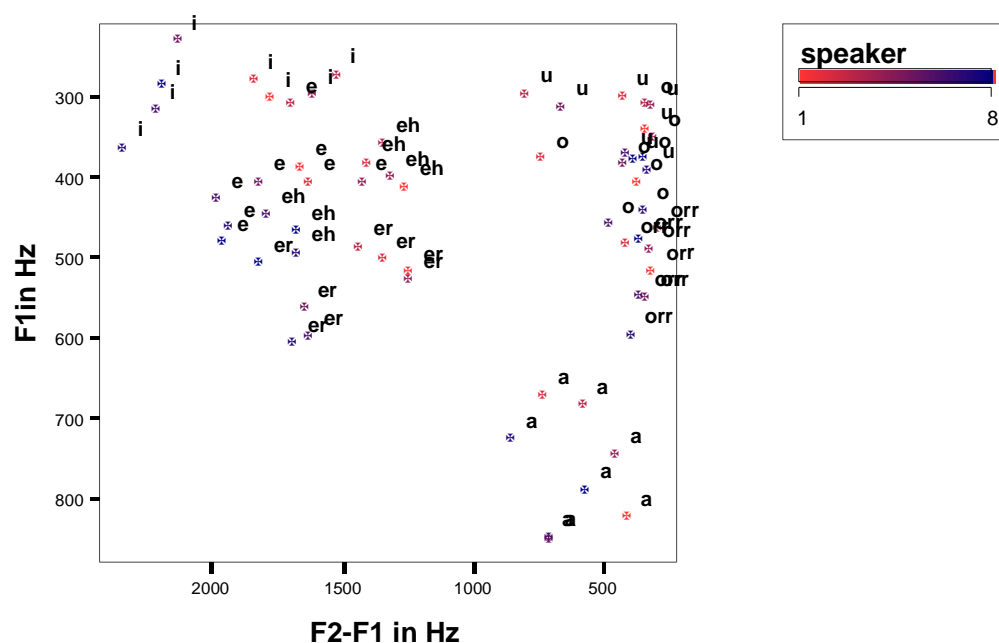


Figure 4.4.1 Formant plot of oral vowels of Kpando speakers. er=ɛ, eh=ə and orr=ɔ.

The Kpando speakers produced [i] with F1 rising between 275 and 330 Hz but while one group produced it with F2' ranging between 1520 and 1845 Hz, the other group had it located very frontal with F2' between 2000 and 2400 Hz. The mid front vowels [e] and [ɛ] as produced by these speakers are scattered around F1 region between 390 and 540 Hz and F2' around 1250 and 1710 Hz. The phonemic status of [ə] as a central vowel is not clear in this case. It has almost merged with [e] and [ɛ] for these speakers. Analysis of variance of the vowels shows that there is no significant difference between these individual speakers. It reads $F(8) = .120$, $p < .996$ for [i], $F(8) = .079$, $p < .999$ for [e], $F(8) = .125$, $p < .995$ for [ɛ] and $F(8) = .110$, $p < .996$ for [ə] respectively. The F1 values for the vowel [a] across all speakers of this dialect ranges higher between 670 and 830 Hz and F2' between 415 and 740 Hz placing its quality very low and back. There is less variability in the F1 values of their back vowels. [u] and [o] overlap in the F1 region of 300 to 530 Hz. But there are however, some differences in F2' for the various speakers. Speaker 2 for example, has [o] produced with F2' of 740.